The Urge to Act:
A Comparison of Active and Passive Socially Responsible Investment Funds in the US

Abstract

Innovative finance vehicles are required to facilitate the transition towards a sustainable society. Here, we investigate two very successful innovations in the fund industry, namely, the index mutual funds and the passively managed exchange traded funds (ETFs). We study socially responsible investment funds in the US and particularly focus on their financial performance, cost of investing, and degree of active management. We do not find persuasive evidence that the actively managed funds perform better than their passively managed counterparts do. Furthermore, we find that some active SRI funds seem to operate as 'closet indexers' with a low degree of active management. We conclude that passively managed socially responsible funds have the potential to enrich the spectrum of financial products that may help advance the sustainability transition.

Keywords

Socially responsible investing; Funds; Fund performance; Active versus Passive; US; ETFs

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Active versus Passive SRI

Xing Chen[a] and Bert Scholtens[a,b,c]

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[a] Centre for Responsible Banking and Finance, University of Saint Andrews, School of Management, The Gateway, North Haugh, Saint Andrews, Fife, KY16 9RJ, Scotland, UK

[b] Faculty of Economics and Business, University of Groningen, PO Box 800, 9700 AV, Groningen, The Netherlands

[c] corresponding author; phone +31-503637064; email l.j.r.scholtens@rug.nl

1. Introduction

With socially responsible investment (SRI), investment opportunities are screened because of their characteristics and performance regarding non-financial dimensions, in particular environmental, ethical, social, and corporate governance characteristics (hereafter labelled as ESG) (see Renneboog et al., 2008a). Such SRI has experienced unprecedented growth over the last two decades: According to the Global Sustainable Investment Alliance (2016), global SRI assets reached $22.8 trillion at year-end 2015, representing more than 25% of total assets under managements. In the US, $8.7 trillion or one-fifth of all investment under professional management are tied to SRI (USSIF, 2016). Hence, SRI has grown from a niche investment strategy to a major investment theme that is widely adopted by the investment community.

In recent years, passively managed funds have come to the SRI scene, which had been traditionally dominated by active mutual funds (Bauer et al., 2005). The emergence of these passive SRI funds raises the question of how responsible investors should manage their investment: actively or passively? In this paper, we want to establish whether this financial innovation actually is useful to responsible investors (see also Randjelovic et al., 2003). The essence of this question lies in the ability of active SRI fund managers to deliver superior performance in order to justify the higher expense ratios charged by active funds (see In et al., 2014).

We study both actively and passively managed US socially responsible investment funds for the period 2004-2015 and use the methods developed by Carhart (1997) and Cremers et al. (2012). We find that there is limited evidence that active SRI funds outperform passive SRI funds at both individual and aggregate levels. Furthermore, we obtain evidence that some active SRI funds appear to operate as 'closet indexers' with low degrees of active management. These findings suggest that in the US, passively managed SRI funds can be

regarded as proper alternatives for actively managed SRI funds. We highlight the lack of transparency for some of the active funds regarding their SRI strategies and selection criteria. Moreover, we have ground to be skeptical of active SRI funds that benchmark their performance to mainstream non-SRI indices, as this practice may not reflect fund performance in an appropriate manner. Our study also fills a gap in the literature, namely the lack of attention for active responsible investing (see Chegut et al., 2011). Further, we use an alternative methodology to assess the value of accounting for responsibility, next to the Ohlson model (see, e.g. Miralles-Quirós et al., 2017ab), data envelopment analysis (Belu, 2009), reporting analysis (Romoloni et al., 2014), and rating analysis (Weber et al., 2014).

The remainder of this paper is structured as follows. Section 2 gives an overview of the literature related to responsible investing and fund performance. Section 3 introduces the data, develops hypotheses, and describes the research methods used. In Section 4, we present and discuss our results. Section 5 concludes the paper.

2. Literature review

Compared to other industries, it seems that the financial sector's performance regarding corporate social responsibility is low in general (Weber et al., 2014). In particular, they are relatively weak on reporting, ethics, and product responsibility (Weber et al., 2014). This is disconcerting as especially reporting is being regarded as a crucial step in the transition towards a more responsible business environment (see Schadewitz and Niskala, 2010; Berthelot et al., 2012; Carnevale et al., 2012; Alonso-Almeida et al., 2014; Romoloni et al., 2014; Mervelskamper and Streit, 2017). Information about a firm's practices regarding corporate governance and social and environmental conduct is key to arrive at an assessment for customers, employees, investors, supervisors, regulators, and policy makers. There are

several methods to assess how sustainability relates to firm value. For example, Belu (2009) engages in data-envelopment analysis to investigate the efficiency of firms in order to arrive at a ranking of their responsibility practices. Miralles-Quiros et al. (2017ab) use information about corporate social responsibility in their financial valuation models. All this information is crucial to arrive at the well-informed construction of sustainable or responsible financial products (Weber et al, 2014; Charlo et al., 2015). These products can play an important role in financial institutions' socially responsible investment strategies (for an overview, see Eurosif, 2016). Financial institutions increasingly try to integrate responsible investment in their strategical and tactical asset allocation and they manage a substantial part of their overall portfolios by somehow accounting for sustainability issues (Chegut et al., 2011; Eurosif, 2016). In this respect, the issue arises how to account for sustainability in asset management. Investigating this issue could inform the much wider debate about corporate social responsibility and financial performance (for this debate, see Bauer et al., 2005; Kempf and Osthoff, 2007; Belu, 2009; Weber et al., 2014).

For asset management, the active versus passive fund management debate has been central to the investment literature since the pioneering study of Jensen (1968). The current consensus is that while there is evidence of skill and persistence for a subset of mutual fund managers, typical active funds do not produce persistent risk-adjusted excess return (i.e. positive alpha) after fees and, hence, average investors will be better off using passive strategies (Busse et al., 2010, 2014; Charlo et al., 2015; Doshi et al., 2015). In recent years, the spectacular rise of passively managed funds reignited this debate, particularly in the form of index mutual funds and exchange-traded funds (ETFs). Together, these two fund types account for over $4 trillion in assets under management, constituting over 20% of all professionally managed assets in the US fund market (Investment Company Institute, 2016). With more and more investors gravitating towards passive funds, academic studies have

started to evaluate actively managed funds with reference to passively managed funds (see Berk and van Binsbergen, 2015).

We want to investigate whether the findings for conventional funds also are applicable to SRI funds, due to the fundamental differences between responsible and conventional investing (Renneboog et al., 2008ab). Most SRI fund studies to date have been devoted to the comparison between SRI funds and conventional funds (Capelle-Blancard and Monjon, 2012). In this respect, most studies establish that SRI funds do not seem to perform worse than their conventional counterparts do (Hamilton et al., 1993; Statman, 2000; Bauer et al., 2005; Kreander et al., 2005; Bello, 2005; Derwall and Koedijk, 2009). By showing that the pursuit of non-financial goals does not compromise financial performance, these studies provide assurance to existing investors of SRI funds and make a strong case for prospective investors to steer their capital towards SRI. However, these findings give no indication as to whether active SRI managers actually possess skills. This is because the performance analysis conducted in these studies jointly tests the performance of the SRI assets and the quality of the fund management. Therefore, one cannot effectively separate the role of SRI themes and the skills of fund managers in achieving the documented performance. To address this issue, studies have used SRI indices (e.g. Schröder, 2007) or hypothetical portfolios (e.g. Kempf and Osthoff, 2007) to show performance differences between SRI and conventional investments (if any). However, passively managed SRI funds did not feature in these studies.

Between active and passive SRI funds that both achieve the social objectives of investors, the excess management fees imposed by active SRI funds is a premium for an active management style. If active management does not deliver better fund performance, rational investors would switch to low-cost passive funds and this process would ultimately drive down the cost of investing in active SRI funds. Cremers et al. (2016) find that explicit

indexing improves competition in the mutual fund industry. In particular, indexed funds force active funds to be more active and charge lower fees for active management (Cremers et al., 2016). Therefore, we will want to conduct a systematic comparison between active and passive SRI funds concerning expense ratios and active management. To this extent, we specifically will address three questions: 1. Do the financial performance and investment styles of actively managed SRI funds significantly differ from their passively managed counterparts. 2. How do expense ratios differ between actively managed and passively managed SRI funds, and what impact do they have on fund performance. 3. To what extent do SRI funds actively manage their portfolios. These questions are at the basis of the hypotheses we put to test; they relate to properties of fund performance and can be used to discriminate active and passive funds. The specific hypotheses are motivated in detail in the next section. By answering the three questions, we first expand the SRI literature by considering passive SRI funds, which seem under-researched in this respect. Second, we accentuate the analytical value of passive SRI funds by comparing them with active SRI funds in a systematic manner. This will help us understand the relative merits between the two groups of SRI funds with contrasting management styles, and will also allow us to assert if active SRI fund managers add value to the investment process. Third, the comparison between active and passive SRI funds informs the wider debate of active versus passive investment fund management.

3. Material and methods

We use the Bloomberg Fund Search Engine and the US Forum for Sustainable and Responsible Investment (USSIF) to identify the SRI funds for our analysis. We take all the SRI mutual funds displayed on the USSIF website as of November 2015 (www.ussif.org) and further augment this list by screening US mutual funds and exchange traded funds (ETFs)

with the attributes of being ethical, environmental, social, and governance related, socially responsible, religiously responsible, environmentally friendly, or clean energy and clean technology focused from Bloomberg. We limit our fund sample to equity funds, excluding fixed-income balanced, and money market funds for which passive funds do not exist. To mitigate the survivorship bias, we include inactive equity funds in our search. Applying the criteria mentioned above, these two sources combined result in 170 funds in total (to avoid double counting, we treat different share classes of the same fund as one). We then obtain the month-end closing total return indices for all available share classes of each fund for the period from December 2004 to December 2015 and calculate their monthly returns. The sample period starts a month prior to the launch of the first ever (passive) SRI ETF (i.e. iShares MSCI USA ESG Select ETF) in the US so that the monthly return series covers the whole operating history of this particular ETF and all the SRI ETFs incepted thereafter. To ensure meaningful regressions, we require the fund to have at least 24 monthly observations to avoid the incubation bias as documented by Evans (2010). This leaves us with 142 funds to analyse. Among these funds, there are 120 actively managed mutual funds, nine index mutual funds, twelve passive ETFs, and one active ETF. As for market status, 109 funds are still active while 33 funds ceased to exist by the end of the sample period.

With regards to the investment strategy classification, we split the sample SRI funds into three broad investment themes, namely environmentally, religiously, and socially responsible fund groups. We distinguish between domestic and international funds since later in the analysis we find that many funds in the sample display non-trivial levels of foreign exposure. Instead of relying on external sources, we will use the fund's loading on foreign exchange exposure to determine if it classifies as domestic or international (see section 3.1). Table 1 gives a summary of the number of funds in each group or sub-group. Appendix A lists all sample funds.

[TABLE-**1**-PLEASE]

We first analyse the risk-adjusted return of sample funds by controlling for well-known investment styles; second, we compare the expense ratios between active funds and passive funds and examine how they affect fund performance; and, third, we quantify the level of active management and relate this to fund performance and expense ratio. In the remainder of this section, we develop our hypotheses and delineate the research method for each analysis in turn.

3.1. Risk-Adjusted Return and Investment Styles

Investors chose active management mainly in anticipation of excess risk-adjusted returns (i.e. positive alpha) on their investments. The success of active management depends crucially on the efficiency of the underlying market. Since our sample SRI funds invest primarily in the US markets, there will be few opportunities for active managers to exploit. As such, we expect only a small number of active SRI funds to generate significant positive alphas. Further, we account for their international exposure. Given the theoretical foundations for the underperformance of SRI funds and the overwhelming empirical evidence that SRI funds perform either on par or worse than conventional funds (Renneboog et al., 2008A; Revelli and Viviani, 2015), there may be more SRI funds with negative than with positive alphas if their returns are benchmarked against non-SRI market indices or portfolios. An efficiently managed passive fund should neither outperform nor underperform the passive benchmark return before fees and slightly underperform after fees. If the underperformance hypothesis holds for SRI funds, the alpha estimates for passive SRI funds may be either statistically insignificant or slightly negative. Theoreticians often argue that active management is a zero-sum game (Fama and French, 2000; Malkiel, 2003). Then, any positive alphas generated by some funds are balanced by negative alphas of other funds. The average

alpha of active SRI funds is likely to be similar to that of passive SRI funds but with higher dispersion. Concerning investment styles, because both active and passive SRI funds are meant to serve the same broad spectrum of clientele, we do not expect any significant differences in their loadings to well-known investment styles (i.e. size, book-to-market, and momentum).

We employ the Carhart (1997) model as the primary tool to investigate the risk-adjusted return and investment styles of sample funds (see also Bauer et al., 2005; Kempf and Osthoff, 2007; Renneboog et al., 2008b). Further, as many of our funds also invest some of the assets outside the US, we need to capture their risk exposure to foreign equities as well. The importance of controlling for foreign exposure in explaining returns of international funds has been recognised in Gregory and Whittaker (2007). Following Elton et al. (1993), we augment the standard Carhart model with a foreign factor that is the orthogonalized international equity market return from the US market return. The model is:

$$r_{p,t} - r_{f,t} = \alpha_p + \beta_{mkt}(r_{m,t} - r_{f,t}) + \beta_{intl} or_{intl,t} + \beta_{smb} r_{smb,t} + \beta_{hml} r_{hml,t} + \beta_{mom} r_{mom,t} + \varepsilon_{p,t} \quad (1)$$

where $r_{p,t} - r_{f,t}$ is the excess return of the fund over the risk-free rate (i.e. the one-month Treasury bill rate) in month t, $r_{m,t} - r_{f,t}$ is the excess return on the US market, $or_{glo,t}$ is the orthogonalized global market return, $r_{smb,t}$, $r_{hml,t}$, and $r_{mom,t}$ are the size, book-to-market and momentum factors; the factors and risk-free rate are taken from Kenneth French's website. α_p is the risk-adjusted return; β_{mkt}, β_{glo}, β_{smb}, β_{hml}, and β_{mom} are the factor loadings on the market premium, the orthogonalized global market return, size, book-to-market, and momentum factors, respectively; ε_p represents the idiosyncratic return. For robustness, we will also use the factor model proposed by Cremers et al. (2012), which uses common market indices (we will refer to it as the Cremers model hereafter). We construct the index-based factors as per the definitions provided on Antti Petajisto's website. The index total returns are downloaded

from Bloomberg. This alternative model has the advantages of reducing alphas for passive funds and yielding less tracking error volatility when used to explain actively managed mutual fund returns. Both could potentially affect the conclusions drawn from our study. The regression results for the two factor models should provide us with a general impression of SRI funds' financial performance and their preferred investment styles. We hypothesize that active SRI funds will display more significant alphas in either direction than passive ones, but that they will be rather similar in terms of their investment styles.

3.2. Expense Ratio and Fund Performance

The expense ratio measures the annual operating costs of running a fund as a percentage of the fund's net assets. The cost of investing is a crucial factor to consider in making any investment decision as it affects the net return on investment. The costs of investing in active SRI funds can be divided into universe selection and active management costs. The former are higher for SRI than with conventional investing due to the lack of organised, standardised and verified information systems for firms' ESG characteristics (Scholtens, 2014). Therefore, SRI funds are subject to higher expense ratios than otherwise similar conventional funds. Active funds have higher expense ratios than passive funds and SRI funds are no exception to this. French (2008) finds active investors sacrificed on average 0.67% return per year. So far, the premium for investing in active SRI funds over passive ones has not been quantified and whether such premium can be justified by managerial skills is a question we will address in this study.

Given that the fund total returns used in equation (1) are net of expenses, the expense ratio dwarfs the alpha estimates. However, a skilled active fund manager should deliver risk-adjusted returns that partially or fully absorb the management fees and expenses. Passive fund managers may slightly underperform because of fund expenses and such underperformance

should be fully explained by the expense ratio. To verify these claims, we conduct two tests. Test 1 is the outperformance test specified as:

H_0: $\alpha_p = -Expense\ Ratio_p/12$

H_1: $\alpha_p > -Expense\ Ratio_p/12$

where α_p is the (monthly) alpha from the factor model for fund p, $Expense\ Ratio_p$ is the annual expense ratio for fund p. The rationale behind this test is that if the fund manager has skills, the fund should be able to generate a positive alpha on gross return. The alpha on net return, though it may be negative, should be greater than zero if we add the expense ratio. For active SRI funds, we expect to reject of the null hypothesis. For passive SRI funds, we do not expect doing so. Test 2 is the underperformance test specified as:

H_0: $\alpha_p = -Expense\ Ratio_p/12$

H_1: $\alpha_p < -Expense\ Ratio_p/12$

For this second test, if the null hypothesis is rejected in favour of the alternative, the fund performs worse than what is expected in the presence of the expense ratio. For active SRI funds, this implies that managers are destroying value. For passive funds, this implies they have not been doing a proper job in tracking the underlying benchmark index. This test will help us detect underperforming SRI funds.

3.3. Level of Active Management

The main objective of active management is to achieve higher alpha (Cremers and Petajisto, 2009; Amihud and Goyenko, 2013; Doshi et al., 2015). A good performing passive fund will display a minimal level of active management. The level of active management exhibited by a fund is an important consideration for fund selection, as it is closely associated

with the costs of investing. Active management requires a higher level of research and/or portfolio turnover that will push up fund expenses. We expect the expense ratio to increase in tandem with the level of active management. As the issue of active management has not been examined for SRI funds in the academic literature (Chegut et al., 2011), initiating this line of empirical enquiry may bring a new perspective to the existing SRI literature. Active management by SRI funds may not only be motivated by alpha generation but also by the need to maintain holdings eligible to SRI standards. We expect to see actively managed SRI funds display higher levels of active management than passively managed SRI funds that should have zero active management.

Our first active management measure is the tracking error (denoted *TE*) which is defined as the time-series standard deviation of $\varepsilon_{p,t}$ from the regression below:

$$r_{p,t} - r_{f,t} = \alpha_p + \beta_p\left(r_{b,t} - r_{f,t}\right) + \varepsilon_{p,t} \quad (2)$$

where $R_{p,t} - R_{f,t}$ is the excess fund return, $R_{b,t} - R_{f,t}$ is the excess return of the fund's benchmark index. This 'continuous' version of the tracking error focuses on the volatility of the difference between the fund return and its benchmark index return while controlling for any β_p-deviation from unity. The second measure is simply the R^2 of regression (2). According to Amihud and Goyenko (2013), $1 - R^2$ measures selectivity by the fund manager, and lower R^2 significantly predicts better performance. It has the advantage of being intuitive and easily calculable while bypassing the complexity of examining portfolio holdings of the fund and its benchmark index (see Cremers and Petajisto, 2009). We expect passive funds to have very low tracking errors and R^2*'s* that are close to 1; we expect active funds to have relatively high tracking errors and low R^2*'s*.4.

4. Empirical Analysis

This section provides the empirical results from the methods introduced in the previous section, and consists of three parts. The first part interprets the alpha and beta estimates from the Carhart and the Cremers model for individual funds and for portfolios of classified fund groups. Further, we compare active and passive SRI funds. The second part investigates the outperformance and underperformance estimations. The third part analyses the active management measures.

4.1. Risk-Adjusted Return and Investment Styles: Alpha and Beta

We first estimate the modified Carhart model and the alternative Cremers model on each fund's total return. To account for any possible time-series correlation of regression residuals, we estimate standard errors using the Newey-West procedure. For funds with multiple share classes which typically differ only in fee structure and target clientele (i.e. retail and institutional investors), we calculate the total net assets (TNA) weighted average returns across fund classes. The regression results at the fund level give an impression of SRI funds' financial performance and their preferred investment styles.

Due to the large number of funds, we do not tabulate the regression results for each individual fund (the detailed regression results are available upon request) but focus on the summary statistics for the alpha and factor loadings instead. To compare active and passive SRI funds, we sort the sample funds into six groups because of their management style (i.e. active or passive) and investment theme (i.e. socially, environmentally, and religiously responsible, see Table 1). Table 2 reports the performance and risk loadings for the aforementioned six fund groups: Panel A presents the summary statistics of the alphas from the Carhart and Cremers models, Panel B shows the average factor loadings. Regardless of which model is used, we expect active SRI funds to produce alphas of higher magnitude in both directions than passive

SRI funds, but the average alpha generated by the two types of funds should be similar. This claim is verified by comparing the mean and standard deviation of the alpha for the passive and active funds. Regarding investment styles, we expect similar average loadings on the risk factors (i.e. betas) between the passive and active fund groups.

[TABLE-**2**-PLEASE]

The top portion of Panel A in Table 2 shows that the mean risk-adjusted return (i.e. alpha) is negative for all three SRI fund categories regardless of the investment theme. The bottom portion of Panel A reveals that, out of the total 142 funds considered, there is only one instance of (marginally) significantly positive alpha using the Carhart model and five using the Cremers model. As expected, none of the passive funds produced significantly positive alpha. Remarkable is the high proportion of both active and passive SRI funds with significantly negative alphas: half of the active funds and the majority of the passive funds in each category register significantly negative alpha at the 10% level under the Carhart model.

For socially responsible funds, the difference in average alphas for active and passive funds is almost unnoticeable, yet the standard deviation of the alphas for the active funds is twice as large as that for the passive ones in the Carhart model and more than triple in the Cremers model. Such high dispersion of alpha implies that an investor will take higher risk in the pursuit of superior performance if she randomly selects an active socially responsible fund. As to the risk factors, it appears that active and passive funds have almost identical loadings on all factors, except that passive funds are more neutral to size as opposed to active funds (which tend to load more on small-caps). The average R^2 is higher for passive funds due to their index mimicking nature.

A completely different picture emerges for environmentally responsible funds. Here, the average performance of passive funds trails behind that of active funds by a sizable margin

while having much higher exposure to market beta (β_{mkt}), foreign equities (β_{glo}), small-cap stocks (β_{smb}), and growth stocks (β_{hml}). All environmental funds in the sample, whether actively or passively managed, fail to generate positive alpha. Moreover, the dispersion of negative alphas of passive funds doubles that of the active ones. Further, passive funds have lower R^2 compared to active funds. One possible explanation is that these passive environmental funds are mostly ETFs focusing on a specific type of renewable energy, whereas their active mutual fund counterparts are much more diversified. Therefore, the two factor models employed may not be able to provide an adequate representation of funds with an inherent bias towards niche energy sectors. This issue will be revisited when we consider the tracking error (section 4.3).

The passive funds in the religiously responsible fund category are obviously underrepresented, which points to the lack of passive investment alternatives in this segment. Nevertheless, the mean and dispersion of alpha of active and passive funds are broadly similar and there are some subtle differences in risk factor loadings. We are inclined to attribute these differences to the small sample size of passive funds.

By comparing the average performance of active and passive SRI funds, we find that the average alpha based on returns net of expenses is negative across different investment themes and management styles. Further, we conclude that although there are no comparable conventional funds in our analysis, the sheer number of SRI funds with negative alphas and the extent to which they underperform supports the underperformance hypothesis of Renneboog et al. (2008b).

Both Carhart and Cremers models provide good explanatory power to the sample SRI fund returns as the average R^2 produced by both models lies above 0.90. However, the alpha (α) and the size premium (β_{smb}) from the Carhart model are systematically downward biased

compared to those of the Cremers model and the reverse pattern is found for the value premium (β_{hml}) and the momentum factor (β_{mom}). This observed difference in the alpha estimates between Carhart and Cremers models is expected for the reasons explained in Cremers et al. (2012) and therefore justifies the use of latter model. Despite these differences, the two models arrive at quite similar conclusions about the investment styles adopted by the SRI funds. Our sample SRI funds are predominantly oriented towards small-cap companies, even though a number of funds label themselves as large-cap funds. Less than one third of the funds have positive exposure to the book-to-market factor, many of which are explicit value funds. This is consistent with existing empirical evidence that SRI funds are gravitated more towards growth stocks and that they are less value-oriented (Bauer et al., 2005). Lastly, the average loading on the momentum factor for fund categories is very close to zero. We also find our sample SRI funds are indifferent between momentum and contrarian investment strategies since the mean coefficient on the momentum factor across all fund categories is very close to zero.

Next, we form pairs of equal-weighted portfolios of comparable active and passive SRI funds according to the fund group classification in Table 1. This allows us to examine whether active SRI funds in aggregate outperform their passive counterparts. We rely on the foreign factor loading to determine if a fund qualifies as domestic or international; we require the magnitude of the foreign factor (i.e. β_{glo}) to be 0.20 or higher. This threshold value is close to the minimal factor loading we observe for most of the self-claimed international SRI funds in the sample while being well above the median value for the sample funds. This treatment results in 65 funds with significant foreign exposure, with several funds with the label 'domestic' being re-classified as international funds and vice versa (see Appendix A). All environmental funds have significant foreign exposure; socially and religiously responsible fund groups have a balanced mix of domestic and international funds. We only differentiate

domestic and international social funds as we lack passive religious funds in the sample. In line with previous studies (Bauer et al., 2005; Renneboog et al., 2008b), we compute the factor loadings for the return differences between actively and passively managed funds. The factor loadings for the Cremers model are presented in Table 3 (we also performed the estimations for the Carhart models, which are qualitatively similar to those of the Cremers model; they are available upon request).

[TABLE-**3**-PLEASE]

Table 3 shows that the alphas are significantly negative for all portfolios and that those for the passive fund portfolios are more negative than those for the active fund portfolios in four out of five cases (domestic socially responsible funds being the exception). This confirms that active management indeed adds value compared to passive management. However, our differentiation along the various SRI fund types shows that the differences in alphas are statistically indistinguishable from zero, except those for environmental funds and just marginally so for international social funds. The active environmental fund's portfolio (Group 4) significantly outperforms its passive counterpart. It suggests that liquidity and risk in the niche markets like solar, wind, biotechnology, etc. is quite different from that in mainstream markets and that the role of information is much more important. For international social funds, there is marginal evidence that the active funds outperform the passive. This is consistent with the findings from the conventional fund literature that active fund management tends to outperform when investing in non-US markets but underperforms in US markets relative to passive management (Dyck et al., 2013). We observe more significant differences in factor loadings between active and passive fund portfolios. In particular, we find active fund portfolio in groups 2, 4 and 5 have lower market beta (β_{mkt}) than their passive counterparts. For domestic social funds (Group 2), the active portfolio has significantly higher exposure to foreign market (β_{glo}) and size (β_{smb}) than the passive one. In

contrast, active environmental funds (Group 4) portfolio shows significantly lower exposure to foreign market and size than passive one. For religious funds (Group 5), active portfolio has less exposure to foreign market but high in momentum factor.

To account for the possible impact of 2007-2009 global financial crisis on our alpha estimate and beta factor loadings, we also add a dummy variable for the 2007-2009 global finance crisis to the regressions estimated in Table 3. Following Nofsinger and Varma (2014), we define the crisis period between October 2007 and March 2009. However, the inclusion of this crisis dummy does not alter the results reported in Table 3 (regression results available upon request). The dummy variable is statistically insignificant for all portfolios with the exception of the passive international socially responsible funds' portfolios (i.e. Group 3 Passive) for which the dummy is positive and marginally significant at the 10% level. Given the overwhelming empirical evidence that conventional funds underperform in market crisis periods (i.e. having negative and significant crisis dummies), our finding reinforces the view that SRI funds are more resilient to market turmoil than conventional funds and offer downside risk protection to investors (e.g. Nofsinger and Varma, 2014; Becchetti et al., 2015).

Overall, active SRI funds tend to outperform passive ones, but the performance differences are subtle and statistically insignificant. This suggests that, for most SRI fund types, responsible investors would not be able to achieve significantly higher risk-adjusted returns by allocating their wealth equally across active SRI funds than if would do so along passive SRI funds. However, this is clearly not the case with environmental funds where active management outperforms. We conclude that the main differences between active and passive SRI investing relate more to market exposures and investment styles.

4.2. Expense Ratio and Fund Performance

The results in Section 4.1 are generated using fund returns net of expenses. We also want to understand how much expense ratios eat into fund returns and how they affect risk-adjusted performance. Given that institutional and retail investors face quite different expense ratios even for the same (mutual) fund, a particular fund may achieve its objective for one type of investors but not for another. Therefore, we treat the institutional investor share class and the retail one of the same fund as separate funds. For mutual funds with multiple share classes, we select Class A share or Investor share to represent the retail investor share class. Class I or Y share or institutional class is used to represent institutional investor share class. This does not apply to ETFs, which do not operate multiple share classes and can be accessed by both institutional and retail investors for the same expense ratio. A comparison of average expense ratios in this respect is provided in Table 4.

[TABLE-**4**-PLEASE]

Table 4 suggests, first, that investors face much higher expense ratios if they choose actively managed SRI funds over passive ones. The differences amount to more than 0.30%, which is in line with the findings of French (2008). Second, institutional mutual fund share classes on average have substantially lower expense ratios than retail ones: The sample contains 74 mutual funds that operate both institutional and retail share classes, and the difference in expense ratio between the two share classes averages to 0.31%. Third, the expense ratios of socially responsible ETFs seem to be as competitive as those of institutional mutual fund share classes, but this is based on just a very small sample. To examine the impact of the expense ratio on the fund's ability to achieve its financial objective, we re-estimate the factor models for each fund share class and then conduct the testing of the

outperformance and the underperformance hypothesis as outlined in Section 3.2. The test results are summarised in Table 5.

[TABLE-**5**-PLEASE]

With social funds, Test 2 (underperformance) is rejected more often than Test 1 (outperformance) for active mutual funds, suggesting that there are more SRI funds underachieving their investment objectives than overachieving them. However, the majority of active SRI mutual funds neither significantly underperform nor outperform the factor model after fees. As such, there is no strong evidence to suggest that retail investor share classes would perform any differently than institutional investor ones. Out of nine passive funds, we find one rejection of Test 1 (outperformance) and two rejections of Test 2 (underperformance). None of the environmental funds produces risk-adjusted returns net of the expense ratio. We find that the number of underperforming funds is disproportionately large for both active and passive environmental funds compared to social funds. Active religious funds register much stronger performance: none of the institutional share classes and only two out of 25 retail share classes for active religious fund see rejection of Test 2.

Considering the overall findings for these performance tests, we are especially surprised about the lack of outperforming active funds, particularly so for social and environmental funds. If the majority of the active SRI funds only manage to keep up with the expense ratio or even trails behind, there seems little justification to invest in them. It could be that their sustainability impact is superior, but there is no sustainability reporting by the funds to substantiate such a claim.

4.3. Level of Active Management

Our two measures of active management are derived from the tracking error model specified in equation (2), which regresses the fund's excess return against its benchmark

index's excess return. Appendix B presents the results of this active management analysis for all funds and the summary statistics of these measures is provided in Table 6.

[TABLE-**6**-PLEASE]

As expected, active SRI funds on average demonstrate higher levels of active management. Their mean tracking error volatility (*TE*), is almost double that of passive social funds and even more than double that for environmental ones. The R^2*'s* for all passive funds are understandably very close to 1, and even the lowest is well above 0.90. The average R^2*'s* for active funds are substantially lower, indicating greater selectivity. Further, the betas for passive SRI funds all are very close to unity. In contrast, there are a number of active funds whose betas deviate from unity in both directions and the deviations can be as large as ±0.50. The average alpha under the tracking error model becomes less negative and is only half the magnitude of the average alpha under the Cremers model and one third of that under the Carhart model. Despite the progressive shift in alpha, only eleven funds manage to beat their respective benchmark indices. A further 28 funds significantly underperform the benchmark indices, with only two of these being passively managed funds. In light of the high variation in beta coupled with the lack of significantly positive alpha of active SRI funds, we infer that some active funds seem to have sought to increase nominal fund returns by persistently allocating fund capital to high-beta or low-beta stocks without adding any superior stock selection skills. For environmental funds, the R^2*'s* and alphas of those passively managed improve substantially under the tracking error model. But this improvement does not necessarily hold for active environmental funds. This lends support to our earlier explanation of why multi-factor models do not do a better job explaining actively managed environmental fund returns than passive ones. This seems to be due to the fact that active environmental funds along with their benchmark indices are more diversified and less concentrated on a

single sub-sector (e.g. solar or wind energy), with the result that they bear more resemblance with the factors in the Cremers and Carhart models.

Although there are noticeable differences in the level of active management between active and passive SRI funds, the degree to which active SRI funds actively manage their portfolios may be overstated due to the methodology that has been employed. The accuracy of the tracking error for actively managed funds depends especially on the identification of the benchmark index. An important issue arising from this feature is that many active SRI fund managers use mainstream non-SRI indices (e.g. S&P 500, Russell and MSCI family indices) to benchmark their performance, whereas most passive SRI funds by design are benchmarked to SRI indices. Please be reminded, as shown in the last column of Appendix A, that there are 22 funds benchmarked to SRI indices. More specifically, eight out of 121 active SRI funds are benchmarked to SRI benchmark indices. For passive SRI funds, all twelve passive ETFs, and only two out of nine index funds are benchmarked to SRI indices.

For SRI funds benchmarked to conventional indices, the tracking errors are artificially higher as the funds often invest in a subset of their respective conventional indices due to screening. In this sense, a proportion of the active management measure may be attributed to passive screening strategies employed by SRI funds because passive screening will always lead to a difference in holdings between the fund portfolio and the (conventional) benchmark index, which would in turn manifest in the return-based measures of active management. Therefore, the 'true' level of active management by SRI funds tends to be overestimated. Active SRI funds may cite this overestimated level of active management to justify the higher expense ratios charged to investors. This is less of a problem for investors of passive SRI funds as high active management is a sign of poor tracking ability – a key measure of passive fund performance. Hence, it would be better if active SRI funds benchmark their performance

against comparable SRI indices. This will provide more accountability to investors as it will allow them to better gauge the value and skills added by the fund manager.

Another interesting finding is that 20 active funds display R^2's higher than the 75-percentile value (0.961) and 26 active funds have *TE's* lower than the 25 percentile value (0.946). Among the latter, there are fourteen overlapping funds (see Appendix C). In this respect, it might be the argued that these active funds are so-called 'closet indexers', which operate like index tracking (passive) funds but claim to be active. The expense ratios of these fourteen suspected 'closet' index funds averages to just above 1% for retail investors and to 0.6% for institutional investors, which both is lower compared to the averages for all active funds, but these ratios are higher compared to what passive funds charge their investors (see also Table 4). Furthermore, the performance of these funds is very much on par with other explicit passive SRI funds. If the potential 'closet indexers' also happen to track non-SRI indices, there would be virtually no difference between the portfolio holdings of these funds and those of conventional funds. Bello (2005) too finds SRI funds and conventional funds quite comparable in terms of performance and many other attributes including assets held, portfolio diversification, and stock picking ability, etc. As such, investors may be over-paying for active management and SRI strategies where none is actually being implemented by the fund manager. This finding echoes the claim by Schwartz (2003) that the ethical mutual fund industry is not always acting in a very ethical manner.

To further assess the potential linkage between the degree of active management and fund performance, we compute the cross correlations between *TE*, R^2, the alpha estimate from the Cremers model and its absolute value. In general, there are two potential interpretations of these correlations. First, active management is a necessary but not sufficient condition for a fund to outperform the benchmark return. However, unsuccessful active management will

result in underperformance. In this sense, active management could affect fund performance in two different ways. First, the active management measures should be strongly correlated with the absolute value of alpha. Alternatively, it can be argued that incompetent active fund managers may revert to follow a benchmark index to avoid registering negative alpha. If this is the case, we should see a positive correlation between active management and the nominal value of alpha. The results are presented in Table 7.

[TABLE-7-PLEASE]

Table 7 shows that the two active management measures share a correlation of -0.75, which implies that a fund with low tracking error volatility (*TE*) is likely to have a high R^2: it has low selectivity. However, unlike some previous studies (Cremers et al., 2009; Amihud and Goyenko, 2013), we do not find a strong association between active management and fund performance. The correlation between *TE* and the absolute alpha amounts to a moderate 0.53, and the correlation between R^2 and $|\alpha|$ stands at -0.32. Nominal alphas share weak negative correlation with both active management measures for all SRI funds. This correlation pattern does not vary if we only consider active SRI funds as shown in the lower left portion of Table 7. One possible explanation for the weak relation is that SRI fund managers simply lack skills. Alternatively, one could argue that they engage in a high level of active management to keep their investments in line with SRI criteria rather than enhance financial return. However, SRI fund managers hardly report about their ESG performance (Scholtens, 2014) and would not be in line with previous studies (Capelle-Blancard and Monjon, 2014).

5. Conclusion

In this paper, we assess the business case of financial innovation in SRI, namely passive socially responsible investment (SRI) funds. SRI is an interesting and noteworthy feature of modern financial intermediation that warrants academic study (Radjelevic et al., 2003). We investigate a sample of 142 US SRI funds for 2004–2015 concerning financial performance and cost of investing between active and passive SRI funds. We try to answer the following questions: Do the financial performance and investment styles of actively managed SRI funds significantly differ from their passively managed counterparts. How do expense ratios differ between actively managed and passively managed SRI funds and what impact do they have on fund performance. To what extent do SRI funds actively manage their portfolios.

We find that although active SRI funds are more expensive, there is no persuasive evidence they exhibit superior financial performance, except for environmentally responsible funds. In general, active and passive SRI funds do not differ in terms of risk-adjusted returns; the differences lie in their loadings for market beta and other investment styles. Hence, passive SRI funds would be preferred by risk-averse responsible investors due to their lower cost of investing and almost indistinguishable performance differential compared to active SRI funds. These findings are reminiscent of Fama and French (2010). The net return alphas to investors are negative for most active SRI funds and only a handful deliver risk-adjusted returns which survive the expense ratios, reflecting a lack of skill of active fund managers. Active SRI funds in general exhibit much higher level of active management than their passive counterparts. However, a number of active SRI funds are exceptions and seem to be disguised as ‘closet indexers’ due to their low level of active management. The study fills a gap, detected in the paper by Chegut et al. (2011), about the state of research in the finance and management literature, namely the lack of attention for active responsible investing. It

complements the existing ranges of methodologies used to assess the value of accounting for responsibility, such as the Ohlson model (Miralles-Quirós et al., 2017ab), data envelopment analysis (Belu, 2009), reporting analysis (Romoloni et al., 2014), and rating analysis (Weber et al., 2014).

These findings seem to favour passive SRI funds as a rational choice for the average responsible investor. Then, it is intriguing that most SRI investment is in active mutual funds, a phenomenon that also exists for conventional funds. One potential explanation is that SRI investors are more concerned with ethical or social issues than with fund performance. SRI funds that engage in high levels of active management do not necessarily produce higher financial performance than those with passive management. Further, our results also seem to be in line with the findings of Benson and Humphrey (2008) and Renneboog et al. (2011) who show that SRI investors are more loyal to SRI mutual funds and less sensitive to past negative returns than are conventional investors. Our findings also question the financial and non-financial fiduciary responsibilities of active SRI fund managers. Passive SRI funds to a large extent alleviate these concerns due to their rather simplistic nature and better transparency.

The analysis and results inform the debate about the relationship between corporate social and financial performance. It is helpful for the investment community in that it shows how active management and passive management relate to sustainability. It is helpful for regulators and supervisors in financial markets and of financial institutions who are concerned about the externalities created by these agents and how they cope with externalities themselves. The study also is of relevance for public policy as it shows and assesses the prospects of socially responsible investing.

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Table 1. Number of Active and Passive SRI Funds in the Classified Fund Groups

Fund Group	Active Funds	Passive Funds
All funds	121	21
Group 1 – Socially responsible funds (all)	73	9
Group 2 – Socially responsible funds (domestic)	50	6
Group 3 – Socially responsible funds (international)	23	3
Group 4 – Environmentally responsible funds	23	10
Group 5 – Religiously responsible funds	25	2

Table 2. Factor Loadings for Active and Passive SRI Fund Groups

	Socially Responsible Funds				Environmentally Responsible Funds				Religiously Responsible Funds			
	Active		Passive		Active		Passive		Active		Passive	
	Carhart	Cremers	Carhart	Cremers	Carhart	Cremers	Carhart	Cremers	Carhart	Cremers	Carhart	Cremers
Panel A: Summary Statistics for α												
Minimum	-0.902	-0.745	-0.443	-0.220	-1.629	-1.407	-3.614	-2.973	-0.724	-0.653	-0.397	-0.374
Median	-0.228	-0.103	-0.240	-0.102	-0.295	-0.182	-1.461	-1.201	-0.209	-0.097	-0.244	-0.167
Maximum	0.509	0.843	-0.054	-0.030	0.384	0.279	-0.526	-0.413	0.190	0.267	-0.091	0.040
Mean	-0.243	-0.122	-0.269	-0.123	-0.530	-0.427	-1.788	-1.490	-0.229	-0.100	-0.244	-0.167
Std. Dev.	0.212	0.228	0.123	0.065	0.552	0.523	1.070	0.868	0.206	0.222	0.217	0.293
No. of funds	73		9		23		10		25		2	
No. of positive α												
At 10%	0	3	0	0	0	0	0	0	1	2	0	0
At 5%	0	2	0	0	0	0	0	0	1	2	0	0
At 1%	0	0	0	0	0	0	0	0	0	1	0	0
No. of negative α												
At 10%	36	21	8	4	12	9	9	9	14	7	2	1
At 5%	30	16	8	3	8	7	9	8	10	4	1	1
At 1%	21	7	7	1	6	4	4	3	4	2	0	0

Panel B: Mean Factor Loadings for βs and R^2

β_{mkt}	1.004	0.984	1.030	1.018	1.170	1.134	1.649	1.615	0.968	0.938	1.110	1.104
β_{glo}	0.230	0.223	0.205	0.201	0.560	0.551	1.156	1.104	0.174	0.188	0.453	0.452
β_{smb}	0.214	0.320	-0.037	0.090	0.320	0.350	0.762	0.799	0.216	0.323	-0.068	0.052
β_{hml}	0.009	-0.085	-0.006	-0.107	-0.195	-0.349	-0.291	-0.618	-0.060	-0.178	0.025	-0.044
β_{mom}	-0.006	-0.031	-0.027	-0.038	0.044	0.014	0.033	0.010	0.006	-0.013	-0.036	-0.051
R^2	0.919	0.924	0.968	0.977	0.880	0.889	0.760	0.778	0.918	0.926	0.938	0.944

Notes: Panel A presents the summary statistics for the alpha estimates generated by the Carhart and the Cremers models for the six groups of funds; Panel B presents the average beta estimates for the six groups of funds.

Table 3. Performance Comparison between Active and Passive SRI Fund Portfolios

		α	β_{mkt}	β_{glo}	β_{smb}	β_{hml}	β_{mom}	R^2
Group 1	Active	-0.138***	0.994***	0.195***	0.298***	-0.130***	-0.043***	0.993
	Passive	-0.196***	1.003***	0.091***	0.086***	-0.118***	-0.057***	0.989
	Difference	0.057	-0.009	0.104***	0.212***	-0.118	0.013	0.550
Group 2	Active	-0.098**	0.962***	0.014	0.349***	-0.130***	-0.047***	0.991
	Passive	-0.074**	0.995***	-0.062***	0.094***	-0.075***	-0.054***	0.991
	Difference	-0.023	-0.033**	0.076***	0.254***	-0.055	0.006	0.575
Group 3	Active	-0.147***	1.066***	0.649***	0.204***	-0.069***	-0.013	0.989
	Passive	-0.217**	1.029***	0.641***	0.071**	-0.132*	-0.013	0.972
	Difference	0.169*	0.039	0.022	0.122	0.089	0.002	0.219
Group 4	Active	-0.291**	1.145***	0.585***	0.380***	-0.400***	0.026	0.944
	Passive	-1.359***	1.624***	1.274***	0.955***	-0.619***	0.061	0.808
	Difference	1.072***	-0.477***	-0.685***	-0.576***	0.225	-0.032	0.492
Group 5	Active	-0.092**	0.940***	0.172***	0.338***	-0.193***	-0.010	0.987
	Passive	-0.204**	1.102***	0.406	0.060	-0.095*	-0.063***	0.961
	Difference	0.111	-0.162***	-0.234***	0.277	-0.098	0.053***	0.542

Notes: this table presents alpha and beta estimates from the Cremers model for equally weighted active and passive SRI fund portfolios formed based on the group classification outlined in Table 1. Alpha and beta estimates are also reported for the return difference between the pair of comparable active and passive SRI portfolios. ***, **, and * indicate statistical significance at 1%, 5% and 10% levels, respectively.

Table 4. Comparison of Average Expense Ratios for SRI Funds

Fund Theme	Active Funds			Passive Funds		
	Institutional	Retail	ETF	Institutional	Retail	ETF
Socially Responsible	0.90 (59)	1.33 (57)	–	0.48 (7)	0.84 (7)	0.5 (2)
Environmentally Responsible	1.12 (17)	1.45 (17)	0.95 (1)	–	–	0.66 (14)
Religiously Responsible	1.06 (10)	1.37 (25)	–	0.57 (2)	0.94 (2)	–

Notes: this table presents the average (annual) expense ratio for active and passive funds of the classified fund groups. The average expense ratios for the institutional and retail mutual fund classes are presented separately. Expense ratios are the last recorded expense ratios by the end of 2015. Numbers in parentheses are the number of funds used for calculation.

Table 5. Summary of the Outperformance and Underperformance Hypothesis Tests

Fund Theme		Active Funds			Passive Funds		
		Institutional	Retail	ETF	Institutional	Retail	ETF
Socially	Test 1	3	6		0	0	0
Responsible	Test 2	8	9	–	1	1	0
		(59)	(57)		(7)	(7)	(2)
Environmentally	Test 1	0	0	0			0
Responsible	Test 2	7	6	0	–	–	9
		(17)	(17)	(1)			(14)
Religiously	Test 1	2	6		1	0	
Responsible	Test 2	0	2	–	1	1	–
		(10)	(25)		(2)	(2)	

Notes: the number on top is the number of funds for which the null hypothesis of Test 1 or Test 2 is rejected at 5% level of significance (i.e. number of outperforming funds or underperforming funds); numbers in the parentheses are the total number of funds considered for the hypothesis tests; hypothesis tests are performed based on the alphas obtained from the Cremers model.

Table 6. Summary Statistics of Active Management Measures

Fund Theme		Active Funds				Passive Funds			
		Mean	Min.	Median	Max.	Mean	Min.	Median	Max.
Socially	*TE*	1.422	0.143	1.271	3.644	0.805	0.297	0.800	1.273
Responsible	R^2	0.897	0.569	0.922	0.999	0.970	0.953	0.971	0.992
Environmentally	*TE*	2.324	0.512	2.097	5.024	1.120	0.607	0.995	2.877
Responsible	R^2	0.845	0.570	0.875	0.991	0.986	0.962	0.990	0.996
Religiously	*TE*	1.561	0.773	1.370	3.982	1.147	0.657	1.147	1.638
Responsible	R^2	0.877	0.414	0.908	0.971	0.954	0.928	0.954	0.980

Notes: this table presents the summary statistics of the two measures of the degree of active management (i.e. *TE* and R^2) calculated for the six groups of SRI funds.

Table 7. Correlation between Active Management Measures and Alpha Estimates

	TE	R^2	α	$\|\alpha\|$
TE	–	-0.75	-0.20	0.53
R^2	-0.75	–	-0.14	-0.32
A	-0.39	0.04	–	–
$\|\alpha\|$	0.57	-0.24	–	–

Notes: this table presents the cross correlation between tracking error volatility (TE), R^2 of Eq.(2), and alpha estimate from Eq.(1). The figures reported in the top-right portion of the table are based on all sample SRI funds while those reported in the lower-left portion of the table are based on active SRI funds only.

Appendices

Appendix A. Operating Details of Sample SRI Funds

Fund Name	Management Style	Fund Type	Fund Classification	Inception Date	Geographic Focus	Benchmark Index
1492 Small Cap Growth Fund	Active	Mutual Fund	Socially Responsible	12/2011	U.S.	Russell 2000 Growth
Alger Green Fund	Active	Mutual Fund	Environmentally Responsible	12/2000	U.S.	Russell 3000 Growth
Alger Green Institutional Fund	Active	Mutual Fund	Environmentally Responsible	12/2000	U.S.†	Russell 3000 Growth
Allianz RCM Global EcoTrends Fund	Active	Mutual Fund	Environmentally Responsible	01/2007	International	FTSE Environmental Technology*
AllianzGI Global Water Fund	Active	Mutual Fund	Environmentally Responsible	03/2008	International	MSCI All Country World
Allied Asset Advisors Inc - Iman Fund	Active	Mutual Fund	Religiously Responsible	06/2000	International	Dow Jones Islamic Market US*
Amana Developing World Fund	Active	Mutual Fund	Religiously Responsible	09/2009	International	MSCI Emerging Markets
Amana Growth Fund	Active	Mutual Fund	Religiously Responsible	02/1994	International†	Russell 2000
Amana Income Fund	Active	Mutual Fund	Religiously Responsible	06/1986	International	S&P 500
American Beacon Small Cap Value II Fund	Active	Mutual Fund	Socially Responsible	11/2011	International†	Russell 2000 Value
American Century NT Core Equity Plus Fund	Active	Mutual Fund	Socially Responsible	12/2011	U.S.	S&P 500
American Israeli Shared Values Capital Appreciation Fund	Active	Mutual Fund	Religiously Responsible	12/2007	International	S&P 500
Appleseed Fund	Active	Mutual Fund	Socially Responsible	12/2006	U.S. †	S&P 500
AQR Tax-Managed Small Cap Momentum Style Fund	Active	Mutual Fund	Socially Responsible	01/2012	U.S.	Russell 2000
Ariel Appreciation Fund	Active	Mutual Fund	Socially Responsible	12/1989	U.S.	Russell Midcap Value
Ariel Discovery Fund	Active	Mutual Fund	Socially Responsible	01/2011	U.S.	Russell 2000 Value
Ariel Focus Fund	Active	Mutual Fund	Socially Responsible	06/2005	U.S.	Russell 1000 Value
Ariel Fund	Active	Mutual Fund	Socially Responsible	11/1986	U.S.	S&P 500
Ave Maria Catholic Values Fund	Active	Mutual Fund	Religiously Responsible	05/2001	U.S.	S&P 500
Ave Maria Growth Fund	Active	Mutual Fund	Religiously Responsible	05/2003	U.S.	S&P 500
Ave Maria Opportunity Fund	Active	Mutual Fund	Religiously Responsible	05/2006	U.S.	Russell 2000
Ave Maria Rising Dividend Fund	Active	Mutual Fund	Religiously Responsible	05/2005	U.S.	S&P 500
Ave Maria World Equity Fund	Active	Mutual Fund	Religiously Responsible	04/2010	International	S&P Global 1200
AXA Enterprise Socially Responsible Fund	Active	Mutual Fund	Socially Responsible	09/2000	International†	MSCI World
Azzad Ethical Fund	Active	Mutual Fund	Religiously Responsible	11/2000	International	Russell/Nomura MidCap Growth with Dividend

Azzad Ethical Income Fund	Active	Mutual Fund	Religiously Responsible	07/2000	U.S. †	S&P 500
Boston Common International Fund	Active	Mutual Fund	Socially Responsible	12/2010	International	MSCI EAFE
Brown Advisory Sustainable Growth Fund	Active	Mutual Fund	Environmentally Responsible	06/2012	U.S.	Russell 1000 Growth
Calvert Capital Accumulation Fund	Active	Mutual Fund	Socially Responsible	03/1988	International†	Russell Midcap Growth
Calvert Emerging Markets Equity Fund	Active	Mutual Fund	Socially Responsible	10/2012	International	MSCI Emerging Markets
Calvert Equity Income Fund	Active	Mutual Fund	Socially Responsible	10/2011	U.S.	Russell 1000
Calvert Equity Portfolio	Active	Mutual Fund	Socially Responsible	08/1987	International†	S&P 500
Calvert Global Alternative Energy Fund	Active	Mutual Fund	Environmentally Responsible	05/2007	International	Ardour Global Alternative Energy*
Calvert Global Water Fund	Active	Mutual Fund	Environmentally Responsible	09/2008	International	Calvert Global Water Research*
Calvert International Equity Fund	Active	Mutual Fund	Socially Responsible	07/1992	International	MSCI EAFE
Calvert International Opportunities Fund	Active	Mutual Fund	Socially Responsible	05/2007	International	MSCI EAFE IMI
Calvert Large Cap Core Portfolio	Active	Mutual Fund	Socially Responsible	04/1998	U.S.	Russell 1000
Calvert Large Cap Value Fund	Active	Mutual Fund	Socially Responsible	12/1999	U.S.	Russell 1000 Value
Calvert Mid Cap Value Fund	Active	Mutual Fund	Socially Responsible	10/2004	U.S.	Russell Midcap Value
Calvert New Vision Small Cap Fund	Active	Mutual Fund	Socially Responsible	01/1997	U.S.	Russell 2000
Calvert Small Cap Fund	Active	Mutual Fund	Socially Responsible	10/2004	U.S.	Russell 2000
Calvert US Large Cap Core Responsible Index Fund	Passive	Mutual Fund	Socially Responsible	06/2000	U.S.	Calvert US Large Cap Core Responsible*
Camco Investors Fund	Active	Mutual Fund	Socially Responsible	08/2004	U.S.	S&P 500
Citizens Core Growth Fund	Active	Mutual Fund	Socially Responsible	03/1995	U.S.	S&P 500
Citizens Global Equity Fund	Active	Mutual Fund	Socially Responsible	02/1994	International	MSCI World
Citizens Small Cap Core Growth Fund	Active	Mutual Fund	Socially Responsible	12/1999	U.S.	Russell 2000 Growth
City National Rochdale Socially Responsible Equity Fund	Active	Mutual Fund	Socially Responsible	01/2005	U.S.	MSCI KLD 400 Social
Cortina Small Cap Growth Fund	Active	Mutual Fund	Socially Responsible	09/2011	U.S.	Russell 2000 Growth
DFA CSTG&E International Social Core Equity Portfolio	Active	Mutual Fund	Socially Responsible	08/2007	International	MSCI World Ex USA USD
DFA CSTG&E US Social Core Equity 2 Portfolio	Active	Mutual Fund	Socially Responsible	08/2007	U.S.	Russell 3000
DFA Emerging Markets Social Core Equity Portfolio	Active	Mutual Fund	Socially Responsible	08/2006	International	MSCI Emerging Markets
DFA International Sustainability Core 1 Portfolio	Active	Mutual Fund	Environmentally Responsible	03/2008	International	MSCI World
DFA International Value ex Tobacco Portfolio	Active	Mutual Fund	Socially Responsible	06/2008	International	MSCI World
DFA US Social Core Equity 2 Portfolio	Active	Mutual Fund	Socially Responsible	10/2007	U.S.	Russell 3000
DFA US Sustainability Core I Portfolio	Active	Mutual Fund	Environmentally Responsible	03/2008	U.S.	Russell 3000

Domini European Social Equity Portfolio	Active	Mutual Fund	Socially Responsible	10/2005	International	MSCI Europe
Domini International Social Equity Fund	Active	Mutual Fund	Socially Responsible	12/2006	International	MSCI EAFE
Domini PacAsia Social Equity Portfolio	Active	Mutual Fund	Socially Responsible	12/2006	International	MSCI EAFE
Domini Social Equity Fund	Active	Mutual Fund	Socially Responsible	06/1991	U.S.	S&P 500
Dreyfus Global Sustainability Fund	Active	Mutual Fund	Socially Responsible	12/2008	International	Dow Jones Sustainability World*
Dreyfus Premier Third Century Fund Inc	Active	Mutual Fund	Socially Responsible	03/1972	U.S.	S&P 500
DWS Clean Technology Fund	Active	Mutual Fund	Environmentally Responsible	09/2007	International	MSCI World
Epiphany FFV Fund	Active	Mutual Fund	Religiously Responsible	01/2007	U.S.	S&P 500
Epiphany FFV Small Cap Fund	Active	Mutual Fund	Religiously Responsible	02/2008	U.S.	S&P 500
ESG Managers Aggressive Growth Portfolio	Active	Mutual Fund	Socially Responsible	01/2010	U.S. †	S&P 500
Eventide Gilead Fund	Active	Mutual Fund	Socially Responsible	07/2008	U.S. †	S&P 500
Fidelity New Millennium Fund	Active	Mutual Fund	Socially Responsible	12/1992	International	S&P 500
Fidelity Select Environment & Alternative Energy Portfolio	Active	Mutual Fund	Environmentally Responsible	06/1989	U.S. †	MSCI World
First Trust Global Wind Energy ETF	Passive	ETF	Environmentally Responsible	06/2008	International	S&P Global Wind Energy*
First Trust NASDAQ Clean Edge Green Energy Index Fund	Passive	Mutual Fund	Environmentally Responsible	02/2007	U.S. †	NASDAQ Clean Edge Green Energy*
First Trust NASDAQ Clean Edge Smart Grid Infrastructure Index Fund	Passive	Mutual Fund	Environmentally Responsible	11/2009	International	NASDAQ OMX Clean Edge Smart Grid Infrastructure*
Firsthand Alternative Energy Fund	Active	Mutual Fund	Environmentally Responsible	10/2007	International	MSCI World
Gabelli SRI Fund Inc	Active	Mutual Fund	Socially Responsible	06/2007	U.S. †	MSCI World Free USD
GMO Tobacco-Free Core Fund	Active	Mutual Fund	Socially Responsible	10/1991	U.S.	S&P 500
Green Century Equity Fund	Active	Mutual Fund	Socially Responsible	06/1991	U.S.	MSCI KLD 400 Social*
Guggenheim Solar ETF	Passive	ETF	Environmentally Responsible	04/2008	International	MAC Global Solar Energy*
Huntington EcoLogical Strategy ETF	Active	ETF	Environmentally Responsible	06/2012	U.S.	MSCI KLD 400 Social*
iShares Global Clean Energy ETF	Passive	ETF	Environmentally Responsible	06/2008	International	S&P Global Clean Energy*
iShares MSCI KLD 400 Social ETF	Passive	ETF	Socially Responsible	11/2006	U.S.	MSCI KLD 400 Social*
iShares MSCI USA ESG Select ETF	Passive	ETF	Socially Responsible	01/2005	U.S.	MSCI USA ESG Select*
Leuthold Global Clean Technology Fund	Active	Mutual Fund	Environmentally Responsible	07/2009	International	S&P 500

LKCM Aquinas Growth Fund	Active	Mutual Fund	Religiously Responsible	07/2005	U.S.	Russell 1000
LKCM Aquinas Small Cap Fund	Active	Mutual Fund	Religiously Responsible	07/2005	U.S.	Russell 2000
LKCM Aquinas Value Fund	Active	Mutual Fund	Religiously Responsible	07/2005	U.S.	Russell 1000
Market Vectors Global Alternative Energy ETF	Passive	ETF	Environmentally Responsible	05/2007	International	Ardour Global Extra Liquid*
Market Vectors Solar Energy ETF	Passive	ETF	Environmentally Responsible	04/2008	International	Market Vector Global Solar Energy*
MMA Praxis International Fund	Active	Mutual Fund	Socially Responsible	04/1997	International	MSCI All Country World Ex USA Local
Neuberger Berman Climate Change Fund	Active	Mutual Fund	Environmentally Responsible	05/2008	International	MSCI World
Neuberger Berman Socially Responsive Fund	Active	Mutual Fund	Socially Responsible	03/1994	U.S.	S&P 500
New Alternatives Fund Inc/fund	Active	Mutual Fund	Environmentally Responsible	09/1982	U.S. †	Russell 2000
New Covenant Growth Fund	Active	Mutual Fund	Religiously Responsible	09/1989	U.S.	S&P 500
Parnassus Asia Fund	Active	Mutual Fund	Socially Responsible	04/2013	International	MSCI EAFE
Parnassus Core Equity Fund	Active	Mutual Fund	Socially Responsible	08/1992	U.S.	S&P 500
Parnassus Endeavor Fund	Active	Mutual Fund	Socially Responsible	04/2005	U.S.	S&P 500
Parnassus Fund	Active	Mutual Fund	Socially Responsible	12/1984	U.S.	S&P 500
Parnassus Mid Cap Fund	Active	Mutual Fund	Socially Responsible	04/2005	U.S.	Russell Midcap
Parnassus Small Cap Fund	Active	Mutual Fund	Socially Responsible	04/2005	U.S.	Russell 2000
Pax Ellevate Global Women's Index Fund	Passive	Mutual Fund	Socially Responsible	10/1993	International	MSCI Daily TR Net World USD
Pax MSCI International ESG Index Fund	Passive	Mutual Fund	Socially Responsible	03/2008	International	MSCI Daily TR Net EAFE USD
Pax World Global Environmental Markets Fund	Active	Mutual Fund	Environmentally Responsible	03/2008	International	MSCI World
Pax World Growth Fund	Active	Mutual Fund	Socially Responsible	04/2007	International†	Russell 3000 Growth
Pax World Small Cap Fund	Active	Mutual Fund	Socially Responsible	03/2008	U.S.	Russell 2000
PowerShares Cleantech Portfolio	Passive	ETF	Environmentally Responsible	10/2006	International	Cleantech*
Powershares Global Clean Energy Portfolio	Passive	ETF	Environmentally Responsible	06/2007	International	WilderHill New Energy Global Innovations TR*
Powershares WilderHill Clean Energy Portfolio	Passive	ETF	Environmentally Responsible	03/2005	U.S. †	ECO*
Praxis Core Stock Fund	Active	Mutual Fund	Socially Responsible	01/1994	U.S.	S&P 500
Praxis Growth Index Fund	Passive	Mutual Fund	Socially Responsible	05/2007	U.S.	S&P 500 Growth
Praxis International Index Fund	Passive	Mutual Fund	Socially Responsible	12/2010	International	MSCI All Country World

						Ex USA
Praxis Small Cap Fund	Active	Mutual Fund	Socially Responsible	05/2007	U.S.	Russell 2000
Praxis Value Index Fund	Passive	Mutual Fund	Socially Responsible	05/2001	U.S.	S&P 500 Value
Professionally Managed Portfolios - Portfolio 21	Active	Mutual Fund	Environmentally Responsible	09/1999	International	S&P 500
Professionally Managed Portfolios - Women's Equity Fund	Active	Mutual Fund	Socially Responsible	10/1993	U.S.	S&P 500
RBB SAM Sustainable Climate Fund	Active	Mutual Fund	Environmentally Responsible	10/2007	International	MSCI World
SEI Institutional Investment Trust - Screened World Equity Ex-US Fund	Active	Mutual Fund	Socially Responsible	06/2008	International	MSCI All Country World Ex USA
Sentinel Sustainable Core Opportunities Fund	Active	Mutual Fund	Socially Responsible	06/1996	U.S.	S&P 500
Sentinel Sustainable Mid Cap Opportunities Fund	Active	Mutual Fund	Socially Responsible	02/1994	U.S. †	Russell Midcap Growth
Shelton Green Alpha Fund	Active	Mutual Fund	Environmentally Responsible	03/2013	International†	S&P 500
Sierra Club Funds - Sierra Club Equity Income Fund	Active	Mutual Fund	Socially Responsible	01/2003	U.S.	S&P 500
Sierra Club Funds - Sierra Club Stock Fund	Active	Mutual Fund	Socially Responsible	10/1998	U.S.	S&P 500
Steward Global Equity Income Fund	Active	Mutual Fund	Religiously Responsible	04/2008	International	S&P 500
Steward International Enhanced Index Fund	Passive	Mutual Fund	Religiously Responsible	02/2006	International	S&P ADR TR
Steward Large Cap Enhanced Index Fund	Passive	Mutual Fund	Religiously Responsible	10/2004	U.S.	S&P 500
Steward Small-Mid Cap Enhanced Fund	Active	Mutual Fund	Religiously Responsible	03/2006	U.S.	S&P 1000
TDAM Global Sustainability Fund	Active	Mutual Fund	Environmentally Responsible	03/2009	International	Dow Jones Sustainability World*
TIAA-CREF Social Choice Equity Fund	Active	Mutual Fund	Socially Responsible	07/1999	U.S.	Russell 3000
Timothy Plan Aggressive Growth Fund	Active	Mutual Fund	Religiously Responsible	10/2000	U.S.	Russell Midcap Growth
Timothy Plan International Fund	Active	Mutual Fund	Religiously Responsible	05/2007	International	MSCI EAFE
Timothy Plan Large/Mid Cap Growth Fund	Active	Mutual Fund	Religiously Responsible	03/1994	U.S.	Russell 1000 Growth
Timothy Plan Large/Mid-Cap Value Fund	Active	Mutual Fund	Religiously Responsible	07/1999	U.S. †	S&P 500
Timothy Plan Small-Cap Value Fund	Active	Mutual Fund	Religiously Responsible	03/1994	U.S.	Russell 2000
Tributary Growth Opportunities Fund	Active	Mutual Fund	Socially Responsible	11/1992	U.S.	Russell Midcap Growth
UBS International Sustainable Equity Fund	Active	Mutual Fund	Socially Responsible	06/1997	International	MSCI World
Vanguard FTSE Social Index Fund	Passive	Mutual Fund	Socially Responsible	05/2000	U.S.	FTSE4Good USA*
Walden Equity Fund	Active	Mutual Fund	Socially Responsible	06/1999	U.S.	S&P 500
Walden Midcap Fund	Active	Mutual Fund	Socially Responsible	08/2011	U.S.	Russell Midcap
Walden Small Cap Innovations Fund	Active	Mutual Fund	Socially Responsible	10/2008	U.S.	Russell 2000
Walden SMID Cap Innovations Fund	Active	Mutual Fund	Socially Responsible	06/2012	U.S.	Russell 2500
Wells Fargo Advantage Small/Mid Cap Core Fund	Active	Mutual Fund	Socially Responsible	12/2007	U.S. †	Russell 2500

Wells Fargo Advantage Social Sustainability Fund	Active	Mutual Fund	Socially Responsible	09/2008	U.S.	S&P 500
Wells Fargo Large Cap Core Fund	Active	Mutual Fund	Socially Responsible	12/2007	U.S.	S&P 500
Winslow Green Growth Fund	Active	Mutual Fund	Environmentally Responsible	05/1994	U.S. †	Russell 2000 Growth
Winslow Green Solutions Fund	Active	Mutual Fund	Environmentally Responsible	11/2007	U.S. †	Russell Midcap Growth

Notes: Inception date is the month/year when the earliest share class of the fund was launched; In the 'Geographic Focus' column, funds marked with † are those whose geographic focus have been reclassified according to the magnitude of the foreign factor (β_{glo}) in the Cremers model; In the last column, SRI benchmark indices are marked with an asterisk.

Appendix B. Regression Outputs for Eq.(2) and Active Management Measures for Sample SRI Funds

Fund Name	α	β	TE	R^2
1492 Small Cap Growth Fund	-0.341	0.920	2.078	0.778
Alger Green Fund	-0.229*	1.021	1.182	0.945
Alger Green Institutional Fund	0.595***	1.055	1.454	0.766
Allianz RCM Global EcoTrends Fund	0.098	0.904	1.675	0.966
AllianzGI Global Water Fund	0.100	0.854	1.713	0.879
Allied Asset Advisors Inc - Iman Fund	-0.105	1.125	1.180	0.940
Amana Developing World Fund	-0.172	0.473	1.427	0.752
Amana Growth Fund	0.340**	0.622	1.728	0.806
Amana Income Fund	0.238**	0.773	1.322	0.861
American Beacon Small Cap Value II Fund	-0.006	0.937	1.309	0.871
American Century NT Core Equity Plus Fund	-0.048	0.991	0.680	0.950
American Israeli Shared Values Capital Appreciation Fund	-0.547*	1.023	2.497	0.843
Appleseed Fund	0.020	0.750	2.349	0.685
AQR Tax-Managed Small Cap Momentum Style Fund	0.122	1.020	0.935	0.948
Ariel Appreciation Fund	-0.152	1.132	1.675	0.922
Ariel Discovery Fund	-0.719**	0.992	2.198	0.801
Ariel Focus Fund	-0.210	1.038	1.602	0.898
Ariel Fund	-0.297	1.468	2.676	0.845
Ave Maria Catholic Values Fund	-0.340**	1.113	1.902	0.861
Ave Maria Growth Fund	0.060	0.957	1.629	0.862
Ave Maria Opportunity Fund	-0.360	0.773	2.342	0.788
Ave Maria Rising Dividend Fund	0.113	0.895	1.230	0.908
Ave Maria World Equity Fund	-0.333***	1.001	1.020	0.937
AXA Enterprise Socially Responsible Fund	-0.262	0.840	1.077	0.847
Azzad Ethical Fund	0.293	0.621	3.982	0.414
Azzad Ethical Income Fund	-0.147	1.095	2.166	0.852
Boston Common International Fund	-0.181**	0.949	0.931	0.951
Brown Advisory Sustainable Growth Fund	0.083	0.951	1.172	0.851
Calvert Capital Accumulation Fund	-0.135	0.935	1.593	0.902
Calvert Emerging Markets Equity Fund	0.502**	0.888	1.410	0.871
Calvert Equity Income Fund	-0.244*	0.904	0.866	0.905
Calvert Equity Portfolio	0.030	0.957	1.055	0.937
Calvert Global Alternative Energy Fund	-0.233	0.864	2.240	0.933
Calvert Global Water Fund	-0.184	1.009	1.434	0.930
Calvert International Equity Fund	-0.378**	1.032	1.930	0.887
Calvert International Opportunities Fund	0.127	0.962	1.531	0.930
Calvert Large Cap Core Portfolio	-0.179***	0.988	0.687	0.975
Calvert Large Cap Value Fund	-0.112	0.991	0.789	0.970
Calvert Mid Cap Value Fund	-0.200	0.863	1.628	0.911
Calvert New Vision Small Cap Fund	-0.591***	0.852	1.753	0.907
Calvert Small Cap Fund	-0.188	0.868	1.798	0.882
Calvert US Large Cap Core Responsible Index Fund	0.023	1.013	0.977	0.954
Camco Investors Fund	-0.448**	0.972	1.880	0.846
Citizens Core Growth Fund	-0.198	1.041	1.405	0.779
Citizens Global Equity Fund	-0.088	0.963	0.888	0.898
Citizens Small Cap Core Growth Fund	-0.098	0.933	1.492	0.881
City National Rochdale Socially Responsible Equity Fund	-0.074	0.985	1.488	0.887
Cortina Small Cap Growth Fund	-0.425	0.937	2.087	0.806
DFA CSTG&E International Social Core Equity Portfolio	0.279***	1.046	1.034	0.972
DFA CSTG&E US Social Core Equity 2	-0.145*	1.124	0.852	0.977

Portfolio				
DFA Emerging Markets Social Core Equity Portfolio	0.024	1.016	1.192	0.973
DFA International Sustainability Core 1 Portfolio	0.008	1.042	0.727	0.986
DFA International Value ex Tobacco Portfolio	-0.152	1.144	1.249	0.967
DFA US Social Core Equity 2 Portfolio	-0.127	1.134	0.905	0.975
DFA US Sustainability Core I Portfolio	-0.043	1.074	0.512	0.991
Domini European Social Equity Portfolio	0.019	1.161	3.644	0.736
Domini International Social Equity Fund	-0.095	1.036	0.951	0.974
Domini PacAsia Social Equity Portfolio	0.084	1.030	2.069	0.923
Domini Social Equity Fund	-0.169*	1.045	0.914	0.959
Dreyfus Global Sustainability Fund	-0.174	1.006	0.839	0.983
Dreyfus Premier Third Century Fund Inc	-0.028	0.998	0.930	0.954
DWS Clean Technology Fund	-0.884**	1.286	2.624	0.902
Epiphany FFV Fund	-0.246**	1.013	0.904	0.946
Epiphany FFV Small Cap Fund	-0.224	1.162	1.913	0.897
ESG Managers Aggressive Growth Portfolio	-0.418***	1.002	0.755	0.961
Eventide Gilead Fund	0.623	1.051	3.580	0.665
Fidelity New Millennium Fund	0.055	1.103	1.715	0.882
Fidelity Select Environment & Alternative Energy Portfolio	-0.100	0.955	2.296	0.788
First Trust Global Wind Energy ETF	-0.080	1.001	0.978	0.989
First Trust NASDAQ Clean Edge Green Energy Index Fund	0.014	1.039	1.012	0.990
First Trust NASDAQ Clean Edge Smart Grid Infrastructure Index Fund	0.032	0.985	0.908	0.970
Firsthand Alternative Energy Fund	-0.831	1.307	5.024	0.648
Gabelli SRI Fund Inc	0.403	0.965	2.476	0.801
GMO Tobacco-Free Core Fund	-0.012	0.859	1.001	0.944
Green Century Equity Fund	0.041**	0.992	0.143	0.999
Guggenheim Solar ETF	0.163*	1.004	1.312	0.993
Huntington EcoLogical Strategy ETF	-0.164	1.001	1.200	0.855
iShares Global Clean Energy ETF	0.140*	1.014	1.104	0.990
iShares MSCI KLD 400 Social ETF	-0.052	1.014	0.800	0.971
iShares MSCI USA ESG Select ETF	-0.024	0.982	0.297	0.992
Leuthold Global Clean Technology Fund	-1.918***	1.444	3.754	0.727
LKCM Aquinas Growth Fund	-0.110	0.971	1.399	0.900
LKCM Aquinas Small Cap Fund	-0.088	0.937	1.370	0.937
LKCM Aquinas Value Fund	-0.123	1.063	1.147	0.942
Market Vectors Global Alternative Energy ETF	0.030	1.003	0.702	0.995
Market Vectors Solar Energy ETF	-0.670**	1.051	2.877	0.962
MMA Praxis International Fund	0.042	1.059	2.450	0.806
Neuberger Berman Climate Change Fund	-0.644	1.035	3.102	0.862
Neuberger Berman Socially Responsive Fund	-0.002	0.990	1.271	0.917
New Alternatives Fund Inc/fund	-0.037	0.852	4.183	0.570
New Covenant Growth Fund	-0.138*	1.020	0.773	0.969
Parnassus Asia Fund	-0.164	0.730	2.308	0.569
Parnassus Core Equity Fund	0.226**	0.849	1.045	0.923
Parnassus Endeavor Fund	0.231	1.063	1.638	0.886
Parnassus Fund	0.067	1.172	2.087	0.851
Parnassus Mid Cap Fund	0.077	0.819	1.441	0.894
Parnassus Small Cap Fund	0.012	0.963	2.285	0.855
Pax Ellevate Global Women's Index Fund	-0.064	0.953	1.087	0.954
Pax MSCI International ESG Index Fund	-0.147	0.964	1.273	0.953
Pax World Global Environmental Markets Fund	-0.108	1.070	2.097	0.878
Pax World Growth Fund	-0.184*	1.054	1.265	0.932
Pax World Small Cap Fund	0.167	0.849	1.932	0.883

PowerShares Cleantech Portfolio	0.043	0.999	0.608	0.993
Powershares Global Clean Energy Portfolio	-0.066	1.033	1.090	0.987
Powershares WilderHill Clean Energy Portfolio	0.068**	1.001	0.607	0.996
Praxis Core Stock Fund	-0.295***	1.009	1.014	0.955
Praxis Growth Index Fund	0.021	0.944	0.453	0.990
Praxis International Index Fund	-0.117*	0.998	0.692	0.975
Praxis Small Cap Fund	-0.115	0.890	1.475	0.932
Praxis Value Index Fund	0.047	1.059	0.715	0.977
Professionally Managed Portfolios - Portfolio 21	-0.111	0.982	1.579	0.875
Professionally Managed Portfolios - Women's Equity Fund	-0.221	0.843	0.806	0.829
RBB SAM Sustainable Climate Fund	-0.237	1.219	3.799	0.838
SEI Institutional Investment Trust - Screened World Equity Ex-US Fund	0.191***	0.992	0.712	0.986
Sentinel Sustainable Core Opportunities Fund	-0.117	1.002	0.899	0.957
Sentinel Sustainable Mid Cap Opportunities Fund	-0.228**	0.922	1.217	0.939
Shelton Green Alpha Fund	-0.060	1.263	3.359	0.570
Sierra Club Funds - Sierra Club Equity Income Fund	-0.410**	0.744	1.016	0.709
Sierra Club Funds - Sierra Club Stock Fund	-0.686**	1.237	2.096	0.855
Steward Global Equity Income Fund	-0.133	0.940	1.291	0.925
Steward International Enhanced Index Fund	-0.160	1.024	1.638	0.928
Steward Large Cap Enhanced Index Fund	-0.005	1.086	0.657	0.980
Steward Small-Mid Cap Enhanced Fund	-0.060	1.056	0.945	0.971
TDAM Global Sustainability Fund	-0.620***	0.949	1.496	0.937
TIAA-CREF Social Choice Equity Fund	-0.047	0.994	0.406	0.991
Timothy Plan Aggressive Growth Fund	-0.224**	0.974	1.339	0.934
Timothy Plan International Fund	-0.090	0.957	1.619	0.920
Timothy Plan Large/Mid Cap Growth Fund	-0.159	0.945	1.241	0.917
Timothy Plan Large/Mid-Cap Value Fund	0.078	0.992	1.429	0.897
Timothy Plan Small-Cap Value Fund	0.041	0.869	1.242	0.940
Tributary Growth Opportunities Fund	-0.015	0.907	1.453	0.912
UBS International Sustainable Equity Fund	-0.084	0.965	1.353	0.938
Vanguard FTSE Social Index Fund	0.036	1.049	0.955	0.961
Walden Equity Fund	-0.025	0.917	0.782	0.961
Walden Midcap Fund	-0.053	0.892	0.813	0.944
Walden Small Cap Innovations Fund	0.071	0.856	1.163	0.947
Walden SMID Cap Innovations Fund	-0.195	0.982	0.751	0.952
Wells Fargo Advantage Small/Mid Cap Core Fund	-0.353	0.952	1.885	0.923
Wells Fargo Advantage Social Sustainability Fund	-0.152	0.940	0.970	0.972
Wells Fargo Large Cap Core Fund	-0.105	0.977	1.207	0.938
Winslow Green Growth Fund	-0.502	1.175	3.352	0.832
Winslow Green Solutions Fund	-1.224**	1.224	3.473	0.896

Notes: this table presents the regression outputs for Eq.(2) and the two measures of the degree of active management described in Section 4.3 for all sample SRI funds. α that is statistically significant at 1%, 5% and 10% level is marked with ***, **, and *. All β estimates are statistically significant at 1% level.

Appendix C. List of potential 'Closet Funds' and Selected Cost and Performance Measures

Fund Name	*TE*	R^2	Expense Ratio (Retail)	Expense Ratio (Institutional)	α
Calvert Large Cap Core Portfolio	0.687	0.975	1.16	1.07	-0.155**
Calvert Large Cap Value Fund	0.789	0.970	1.23	0.98	-0.126*
DFA CSTG&E US Social Core Equity 2 Portfolio	0.852	0.977	–	0.32	-0.034
DFA International Sustainability Core 1 Portfolio	0.727	0.986	–	0.49	0.041
DFA US Social Core Equity 2 Portfolio	0.905	0.975	–	0.28	-0.037
DFA US Sustainability Core I Portfolio	0.512	0.991	–	0.32	0.006
Dreyfus Global Sustainability Fund	0.839	0.983	1.1	0.85	-0.352**
ESG Managers Aggressive Growth Portfolio	0.755	0.961	1.08	0.83	-0.173***
Green Century Equity Fund	0.143	0.999	1.25	–	-0.108
New Covenant Growth Fund	0.773	0.969	1.02	–	-0.125***
SEI Institutional Investment Trust - Screened World Equity Ex-US Fund	0.712	0.986	–	0.36	-0.115*
Steward Small-Mid Cap Enhanced Fund	0.945	0.971	0.9	0.62	0.069
TIAA-CREF Social Choice Equity Fund	0.406	0.991	0.46	0.18	-0.031
Walden Equity Fund	0.782	0.961	–	1.00	-0.046

Notes: '–' indicates that the respective fund class does not exist. α reported in the last column is based on the Cremers model.